

REMARKS

By the foregoing amendment, Claims 16-44 have been cancelled, and new Claims 45 through 61 have been added. Moreover, Claims 1-15 have previously been cancelled, so that Claims 45 through 61 are the only claims which remain of record.

The rejection of Claims 16-40 under 35 U.S.C. § 112, second paragraph has been rendered moot by the cancellation of those claims.

Similarly, the rejection of Claims 16-44 on prior art grounds, based on the Twigg, Twigg et al and Stanglmaier et al references has also been rendered moot. In order to advance the prosecution of this application, Applicants provide the following comments with regard to new Claims 45-61 and the distinctions between those claims and the cited prior art.

The present invention is directed to a method and apparatus for exhaust gas aftertreatment of an exhaust gas stream generated by a combustion device, such as an internal combustion engine. In particular, the present invention utilizes a nitrogen oxide storage catalytic converter, also known as an NO_x storage catalytic converter to purify the exhaust gas from an internal combustion engine. In conventional devices of the generic type, during lean operating phases of the internal combustion engine, the nitrogen oxide storage catalytic converter oxidizes nitrogen monoxide to form nitrogen dioxide, which it temporarily stores

in the form of nitrates. In order to regenerate the nitrogen oxide storage catalytic converter, the internal combustion engine is periodically switched to a rich operation mode, for brief regeneration phases in which stored nitrates are removed from the nitrogen oxide storage catalytic converter by converting them into nitrogen dioxide and then nitrogen monoxide. The latter is then reduced to form nitrogen by suitable reducing agents.

New Claim 55 defines an exhaust gas aftertreatment method for a combustion device which is operated under lean burning conditions. The method includes temporarily storing nitrogen oxides from the exhaust gas in a nitrogen oxide storage catalytic converter during adsorption phases, and releasing the stored nitrogen oxides from the nitrogen oxide storage catalytic converter during regeneration phases, such that ammonia is generated. The ammonia is then stored temporarily, and is used for nitrogen oxide reduction in a selective catalytic converter arranged downstream of nitrogen oxide catalytic converter. Finally, for the purpose of regenerating the nitrogen oxide storage catalytic converter, the exhaust gas air ratio upstream of the nitrogen oxide catalytic converter is periodically reduced briefly into the rich range, by feeding a reducing agent into the exhaust gas stream during respective regeneration phases.

New Claim 45 is an apparatus claim which is similarly limited. In particular, Claim 45 defines an installation for aftertreatment of exhaust gas

generated by a combustion device, which includes a nitrogen oxide storage catalytic converter for temporarily storing nitrogen oxides contained in the exhaust gas during adsorption operating phases in which the exhaust gas has a lean exhaust gas air ratio, and releasing and reducing the stored nitrogen oxides during regeneration operation phases, with a rich exhaust gas air ratio, thereby generating ammonia. An SCR catalytic converter is arranged downstream of the nitrogen oxide storage catalytic converter and is configured to receive and store ammonia generated by the nitrogen oxide storage catalytic converter, and to reduce nitrogen oxides in the exhaust gas using the stored ammonia. Finally, a reducing agent supplying device is coupled to feed reducing agent to the exhaust gas downstream of the combustion device and upstream of the nitrogen oxide storage catalytic converter, such that during a lean burn operation of the combustion engine, the exhaust gas air ratio upstream of the nitrogen oxide storage catalytic converter can be lowered into the rich range for the purpose of regenerating the nitrogen oxide storage catalytic converter during regeneration phases.

As is apparent from the foregoing brief description, the invention as defined in independent Claims 45 and 55 is directed to an exhaust gas aftertreatment system and method which includes internal production of ammonia by reduction of nitrogen oxide which is temporarily stored in a nitrogen oxide storage catalytic converter. None of the cited prior art teaches or suggests

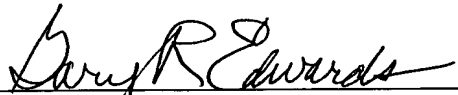
such a system or method. In particular, Twigg '874, Twigg et al '265 and Kupe et al do not disclose or suggest an exhaust gas aftertreatment device with the capability of generating ammonia internally. Stanglmaier, on the other hand, does not teach or suggest the provision of a regeneration phase in which the engine remains in a lean running mode, while at the same time the exhaust gas is enriched by means of a reducing agent supplying device. Moreover, Stanglmaier et al also discloses that a particulate filter is situated upstream of the nitrogen oxide storage catalytic converter, as opposed to Claim 45, in which the particulate filter is arranged upstream of the selective catalytic reduction catalytic converter and downstream of the nitrogen oxide storage catalytic converter. Accordingly, Applicants respectfully submit that Claims 45 and 55, and therefore all claims of record in this application distinguish over the cited references, and are allowable.

In light of the foregoing remarks, this application should be in condition for allowance, and early passage of this case to issue is respectfully requested. If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

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If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #095309.56500US).

Respectfully submitted,



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